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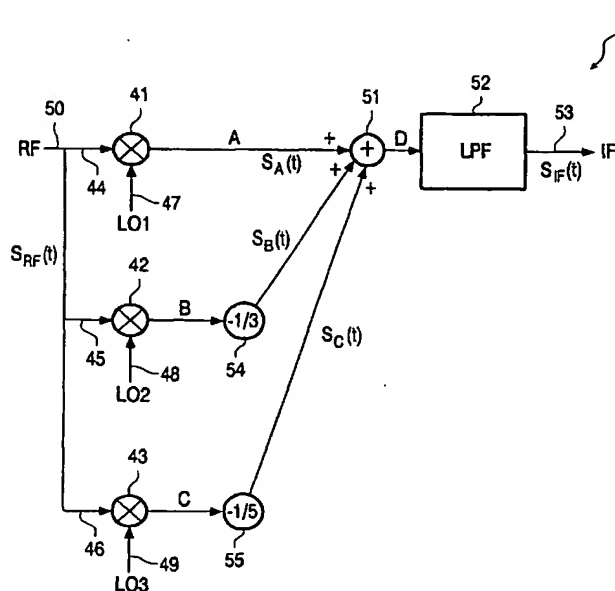
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(54) Title: IMPROVED MIXERS WITH A PLURALITY OF LOCAL OSCILLATORS AND SYSTEMS BASED THEREON



(57) Abstract: Apparatus (40) for processing an input signal ( $S_{RF}(t)$ ) with a carrier frequency ( $f_{RF}$ ) defining a desired band and at least a sideband being defined by a sideband frequency ( $n f_{LO}$ ) that is higher than the carrier frequency ( $f_{RF}$ ). The apparatus (40) comprises a main input (50) for receiving said input signal ( $S_{RF}(t)$ ) and a first standard mixer (41) having a first mixer input (44), a first local oscillator input (47), and a first mixer output (A). The first mixer input (44) is connected to the main input (50) and the first local oscillator input (47) is connected to a source that provides a first local oscillator signal (LO1) having a frequency ( $f_{LO}$ ). This frequency ( $f_{LO}$ ) is close to or equal to the carrier frequency ( $f_{RF}$ ). The first standard mixer (41) performs a multiplication of the input signal ( $S_{RF}(t)$ ) and the first local oscillator signal (LO1) to provide a first output signal ( $S_A(t)$ ) at the first mixer output (A). The apparatus (40) further comprises a second mixer (42) with a second mixer input (45), a second local oscillator input (48), and a second mixer output (B). The second mixer input (45) is connected to the main input (50) and the second local oscillator input (48) is connected to a source that provides a second local oscillator signal (LO2) with the sideband frequency ( $n f_{LO}$ ). The second mixer (42) performs a multiplication of the input signal ( $S_{RF}(t)$ ) and the second local oscillator signal (LO2) to provide a second output signal ( $S_B(t)$ ) at the second mixer output (B). There are means for superpositioning (51) the first output signal ( $S_A(t)$ ) and the second output signal ( $S_B(t)$ ). The first local oscillator signal (LO1) and the second local oscillator signal (LO2) are square-wave signals. The apparatus (40) may comprise a third source that provides a third local oscillator signal (LO3). This third local oscillator signal (LO3) can be fed a mixer (43) where a multiplication is performed. If such a third source is used, the means for superpositioning (51) perform a superpositioning of three signals ( $S_A(t)$ ), ( $S_B(t)$ ), and ( $S_C(t)$ ).

of the input signal ( $S_{RF}(t)$ ) and the second local oscillator signal (LO2) to provide a second output signal ( $S_B(t)$ ) at the second mixer output (B). There are means for superpositioning (51) the first output signal ( $S_A(t)$ ) and the second output signal ( $S_B(t)$ ). The first local oscillator signal (LO1) and the second local oscillator signal (LO2) are square-wave signals. The apparatus (40) may comprise a third source that provides a third local oscillator signal (LO3). This third local oscillator signal (LO3) can be fed a mixer (43) where a multiplication is performed. If such a third source is used, the means for superpositioning (51) perform a superpositioning of three signals ( $S_A(t)$ ), ( $S_B(t)$ ), and ( $S_C(t)$ ).